Department of Natural Resources

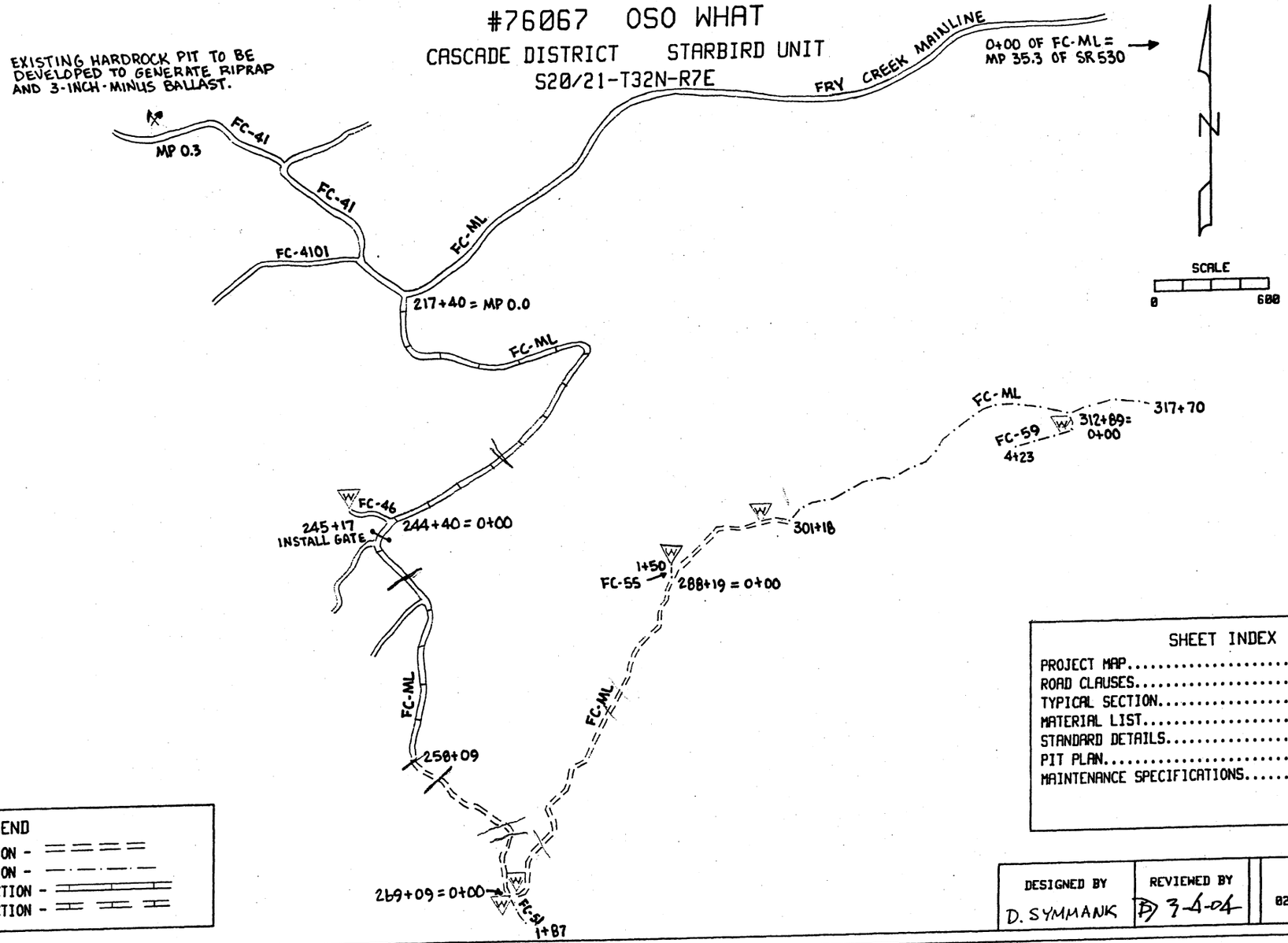
NORTHWEST REGION

ROAD PLAN AND SPECIFICATIONS

#76067 OSO WHAT

CASCADE DISTRICT STARBIRD UNIT

S20/21-T32N-R7E



LEGEND

REQUIRED CONSTRUCTION -

OPTIONAL CONSTRUCTION -

REQUIRED RECONSTRUCTION -

OPTIONAL RECONSTRUCTION -

SHEET INDEX

DESIGNED BY	REVIEWED BY	DATE	SHEET
D. SYMMANK	3-4-04	02-23-04	1 OF 20

SECTION 0 - SCOPE OF PROJECT

This project includes but is not limited to the following major items:

1. Construction of the FC-ML (Fry Creek Mainline), FC-51, FC-55, and FC-59 totaling 67.21 stations. Construction will involve clearing, grubbing, excavation and embankment to subgrade, full bench end haul, landing and turnout construction, culvert installation, and application of 3-inch-minus ballast rock.

2. Reconstruction of the FC-ML totaling 40.69 stations. Reconstruction will involve blading, shaping and ditching the road surface, culvert installation, gate installation, and application of 3-inch-minus ballast rock.

3. Development of an existing hardrock source at milepost 0.3 of the FC-41 road. Development will involve clearing, stripping, drilling, shooting, and processing rock to generate riprap and 3-inch-minus ballast.

Construction centerline is staked. Any additional staking or referencing necessary to build the road to the following specifications shall be the responsibility of the Purchaser. Construction staking notes are available on request.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction and reconstruction including landings unless otherwise noted.

1.1-2

Construction or reconstruction of the following roads is required. These roads shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Length	Type
FC-ML	217+40 to 258+09 4069	Reconstruction
FC-ML	258+09 to 301+18 4309	Construction

1.1-3

Construction of the following roads is not required. If the Purchaser elects to use these roads, they shall be constructed on the State's location and in accordance with this Road Plan.

Road	Length	Type
FC-ML	301+18 to 317+70 1652	Construction
FC-51	0+00 to 1+87	Construction
FC-55	0+00 to 1+50	Construction
FC-59	0+00 to 4+23	Construction

1.1-4

If the purchaser desires a road location or design change, a revised road plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or purchaser's choice of construction season or techniques shall be at the purchaser's expense.

1.2-1

Construction, reconstruction, or abandonment, of any road shall not be permitted between November 1 and March 31 unless authorized in writing by the contract administrator. If permission is granted to operate between November 1 and March 31, the purchaser may be required to provide a "Closed Season Plan" to include further protection of water, soil, roads, and other forest assets.

1.2-2

Purchaser shall not use roads constructed or reconstructed under this Road Plan for hauling, other than timber cut on the right of way, without written approval from the contract administrator.

1.2.1-1

Pioneering shall not extend past construction that will be completed during the current construction season. Pioneering shall not extend more than 500 feet beyond completed construction at any given time unless approved, in writing, by the contract administrator. In addition, the following measures will be taken as pioneering progresses:

- Drainage shall be provided on all uncompleted construction as approved, in writing, by the contract administrator.
- Clearing and grubbing shall be completed prior to starting excavation and embankment.
- Culvert placement in live streams shall precede embankment.
- Culverts shall be installed in completed subgrade as construction progresses.
- Subgrade, ditches and culvert installations, once completed, are subject to written approval by the contract administrator prior to rock application.

1.3-1

Rock hauling on any road shall not be permitted between November 1 and March 31 unless authorized in writing by the contract administrator. If permission is granted to operate between November 1 and March 31, the purchaser may be required to provide a "Closed Season Plan" to include further protection of water, soil, roads, and other forest assets.

1.5-1

Maintenance on roads listed in Contract Clause C-50: Purchaser Road Maintenance and Repair shall be performed in accordance with "Forest Access Road Maintenance Specifications." If permission is granted to operate between November 1 and March 31, the purchaser shall be required to maintain all haul roads including those listed as "designated maintainer roads". If other operators are using, or desire to use these "designated maintainer roads", a joint operating plan shall be developed. All parties shall follow this plan.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the contract administrator.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 10 feet high between the marked right of way boundaries or if not marked in the field, between clearing limits specified on "Typical Section Sheet."

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the "Typical Section Sheet." Also those stumps with roots undercut by excavation shall be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the "Typical Section Sheet."

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right of way debris is defined as all non-merchantable vegetative material larger than one cubic foot in volume within the clearing limits, excluding stumps between the clearing limits and grubbing limits.

4.1-2

All right of way debris disposal shall be completed prior to the application of rock.

4.2.3-3

Right of way debris shall not be placed against standing timber.

4.2.3-4

Right of way debris shall be scattered outside the clearing limits in natural openings, unless otherwise detailed in this plan.

4-3

On the following road segments all right of way debris shall be end hauled or pushed to the designated waste area.

Road	Excavation Location	Disposal Location
FC-ML	291+87 to 298+80	1. FC-46 1+50 to 2+30 2. FC-ML 268+08 to 270+20, inside switchback. 3. FC-51 0+00 to 1+38, on bench west of road. 4. FC-55 beyond 1+50. 5. FC-ML 300+48 to 301+18 north of road. 6. FC-59 0+00 to 1+26, inside switchback. Right of way debris should not be buried with excavated material.

SECTION 5 - EXCAVATION

5.1-1

Unless controlled by construction stakes or specific design sheets herein, roads shall be constructed in accordance with dimensions shown on the "Typical Section Sheet."

5.1-2

Purchaser shall not bury merchantable material.

5.1-3

Road grade and alignment shall conform to the State's marked location and drawings. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are 18 percent favorable and 15 percent adverse, unless otherwise detailed in this plan. Minimum radius curve is 50 feet.

5.1-5

Curve widening on the inside of curves shall be 2 feet extra on 80 to 100 foot radius curves and 4 feet extra on 50 to 79 foot radius curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the "Typical Section Sheet," within the tolerances listed below. Tolerance classes for each road are listed on the "Typical Section Sheet."

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade Elevation (feet +/-)	0.5	1.0	2.0
Centerline Alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table except as construction staked or designed:

Material Type	Excavation Slope Ratio
Common Earth	1:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Except as construction staked or designed, embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table except as construction staked or designed:

Material Type	Embankment Slope Ratio
Common earth and rounded gravel	1½:1
Angular rock	1¼:1
Sandy Soils	2:1

5.1-12
Organic material shall be excluded from embankment.

5.1-14
Where side slopes exceed 50 percent, full bench construction shall be utilized for the entire subgrade width except as construction staked or designed.

5.1-16
On the following road segments full bench construction shall be utilized with all excavated material end hauled or pushed to designated waste area.

Road	Excavation Location	Disposal Location
FC-ML	273+45 to 275+90 279+77 to 298+80 304+46 to 310+42 313+41 to 316+90	1. FC-46 1+50 to 2+30 2. FC-ML 268+08 to 270+20, inside switchback. 3. FC-51 0+00 to 1+38, on bench west of road. 4. FC-55 beyond 1+50. 5. FC-ML 300+48 to 301+18 north of road. 6. FC-59 0+00 to 1+26, inside switchback. Right of way debris should not be buried with excavated material.

5.1-17
On the following road segments all excavated material in excess of that which is needed to construct the designed fill shall be end hauled or pushed to designated waste area.

Road	Excavation Location	Disposal Location
FC-ML	264+82 to 273+45 275+90 to 279+77 298+80 to 304+46 310+42 to 313+41 316+90 to 317+70 No excavated material on slopes greater than 50%	1. FC-46 1+50 to 2+30 2. FC-ML 268+08 to 270+20, inside switchback. 3. FC-51 0+00 to 1+38, on bench west of road. 4. FC-55 beyond 1+50 5. FC-ML 300+48 to 301+18 north of road. 6. FC-59 0+00 to 1+26, inside switchback. Right of way debris should not be buried with excavated material.

5.1-21
Waste material shall not be deposited within 30 feet of a culvert installation.

5.1-22
Waste material shall not be deposited within 30 feet of a live stream.

5.1-23
Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit final subgrade alignment and sight distances. Locations shall be subject to written approval of the contract administrator.

5.1-24
Turnouts shall be intervisible with a maximum of 1,000 feet between turnouts unless shown otherwise on drawings. Minimum dimensions are shown on the "Typical Section Sheet."

5.2-1
Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the clearing limits or restrict drainage.

5.3-1
All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts.

5.4-1
Silt-bearing runoff shall not be permitted to go into streams.

5.5-2
Constructed or reconstructed subgrades shall be compacted.

5.5-5
Finished subgrade shall be crowned as shown on "Typical Section Sheet," uniform, firm, rut-free and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1
Purchaser shall furnish, install and maintain galvanized metal (AASHTO specification No. M36) or corrugated polyethylene tubing (AASHTO specification No. M294) culverts as designated on the "Materials List."

6.2.1-2
Annular corrugated bands and culvert ends shall be used on metal culverts. On culverts 24 inches and smaller, bands shall have a minimum width of 12 inches; on culverts over 24 inches, bands shall have a minimum width of 24 inches. Manufacturer's approved connectors shall be used for corrugated polyethylene tubing.

6.2.1-5
On required roads: culverts, downspouts, flumes, bands and gaskets as listed on the "Materials List" which are not installed shall become property of the State.

6.2.1-6
Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of diameter.

Diameter	Gage	Corrugation
18"	16 (0.064")	$2\ ^{2}/_{3}$" X $^{1}/_{2}$"
24" to 48"	14 (0.079")	$2\ ^{2}/_{3}$" X $^{1}/_{2}$"
54" to 96"	14 (0.079")	3" X 1"

6.2.2.1-1

Culvert, downspout, flume and energy dissipator installation shall be in accordance with the "Culvert and Drainage Specifications" and the National Corrugated Steel Pipe Association Installation Manual for Corrugated Steel Drainage Structures.

6.2.2.2-1

Any damaged galvanized coating or cut ends shall be retreated with a minimum of 2 coats of zinc rich paint.

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3 percent shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not at less than 3 percent.

6.2.2.4-1

Installations of culverts 36 inches in diameter and over shall be subject to written approval by the contract administrator prior to making backfill.

6.2.2.5-1

Drainage structure out falls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade and shall drain to culverts, ditchouts, and natural drainages.

6.3-2

Shaping the ditch line, culvert headwalls and catch-basins shall be completed prior to application of rock and shall be done in accordance with the "Typical Section" and "Culvert and Drainage Specifications" sheets.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with the "Culvert and Drainage Specifications: Catch Basin" drawing. Minimum dimensions shall be two feet wide and four feet long with back slopes consistent with Clause 5.1-8: Excavation-Slopes.

6.5-1

Headwalls shall be constructed in accordance with the "Culvert and Drainage Specifications Headwall" drawing at all ditch relief culverts.

SECTION 7 - ROCK

7.1-1

Rock for construction or reconstruction under this contract may be obtained from an existing pit on State land as listed below. Development and use shall be in accordance with a written "Pit Development and Reclamation Plan" prepared by the Purchaser and subject to written approval by the contract administrator. Upon completion of pit operations, the pit shall be left in the condition specified in said plan, subject to written approval by the contract administrator. Use of material from any other source must have prior written approval from the contract administrator. If other operators are using, or desire to use this pit, a joint operating plan shall be developed. All parties shall follow this plan.

Pit Location	Remarks
FC-4103 Hardrock Pit NE¼NW¼ SEC. 20 T32N R07E, W.M.	Development of an existing hardrock source at milepost 0.3 of the FC-41 road. Development will involve clearing, stripping, drilling, shooting, and processing rock to generate riprap and 3-inch-minus ballast.

7.1-5

Rock for ballast, or riprap may be obtained from private sources at Purchaser's expense. The quality of any alternate rock must be equal to or greater than the quality of the rock specified in clause 7.1-1. Use of rock from any alternate source is subject to written approval from the contract administrator.

7.2.1.1-7

3-inch-minus ballast rock shall be 100% equal to, or smaller than, 3 inches in at least one dimension.

7.2.1.2-2

Rock shall contain no vegetative debris, dirt, or trash.

7.4.2-1

Apply at least the minimum required rock quantity as shown on "Typical Section Sheet."

7.4.2-2

Subgrade shall be approved, in writing, by the contract administrator prior to application of rock.

7.4.2-7

Turnouts and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8

Each lift of rock shall be crowned as shown on "Typical Section Sheet," and shall be uniform, firm, rut-free and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-3

Rock shall be spread, shaped and compacted concurrently with rock hauling operations.

7.4.4-1

Riprap shall consist of angular stone placed as indicated in this plan, or as directed by the contract administrator.

Loose Riprap - The stone for loose riprap shall be hard, sound and durable. It shall be free from segregation, seams, cracks and other defects tending to destroy its resistance to weather. Loose riprap shall be free of rock fines, soil or other extraneous material.

Heavy Loose Riprap Grading Requirements		
At Least/Not More Than	Minimum Size	Maximum Size
40% / 90%	1 Ton (1/2 cu. yd.)	--
70% / 90%	300 lbs. (2 cu. ft.)	---
10% / 30%	---	50 lbs.

Light Loose Riprap Grading Requirements		
At Least /Not More Than	Size Range	Maximum Size
20% / 90%	300 lbs. to 1 Ton	---
80% / ----	50 lbs. to 1 Ton	---
10% / 20%	---	50 lbs.

7.4.4-2

Riprap shall be set in place in conjunction with or immediately following construction of the embankment. No placement by end-dumping or dropping of riprap shall be allowed.

SECTION 8 – STRUCTURES

8.1- LOCATION

The Purchaser shall install each structure listed in the table below in accordance with this plan.

Road	Location	Structure/Remarks
FC-ML	245+17	Install Gate

8.2 - GATE REQUIREMENTS

A gate and lock box has been fabricated at Indian Ridge Treatment Center near Arlington. After making arrangements through the contract administrator, the Purchaser shall be required to transport the gate and lock box to the installation site. The gate and lock box shall be installed plumb and aligned with the type of craftsmanship that insures all mating components match with precision. Each post shall be set in at least 4 cubic yards of commercial class concrete.

SECTION 9 - ROAD AND LANDING TREATMENT

9.1-1

The following roads shall be abandoned by the Purchaser prior to the termination of this contract.

Road	Location	Treatment
FC-ML	301+18 to 317+70	Abandon
FC-51	0+00 to 1+87	Abandon
FC-55	0+00 to 1+50	Abandon
FC-59	0+00 to 4+23	Abandon

9.1-3

"Abandoned" treatment shall consist of:

1. Remove all ditch relief culverts. The resulting slopes shall be 1:1 or flatter. The removed fill material shall be placed and compacted in a location that will not erode into any type 1 through 5 waters or wetlands.

2. Remove all culverts in natural drainages. The resulting slopes shall be 1:1 or flatter. Strive for matching the existing native streambank gradient. The natural streambed width shall be re-established. The removed fill material shall be placed and compacted in a location that will not erode into any type 1 through 5 waters or wetlands.

3. All removed culverts shall be property of the Purchaser and shall be transported off site.

4. Construct non-drivable waterbars at natural drainage points and at a spacing which will produce a vertical drop of no more than 20 feet between waterbars and with a maximum horizontal spacing of 400 feet.

5. Waterbars shall be skewed at least 30 degrees from perpendicular to the road centerline on roads in excess of 3 percent grade.

6. Waterbars shall intercept the ditch and be keyed into the road cut slope and be outsloped to provide positive drainage. Outlets shall be on stable locations.

7. Inslope or outslope the road as appropriate.

8. Remove bridges and other structures.

9. Pull back unstable fill that has potential of failing and entering any type 1 through 5 waters or wetlands. Removed material shall be placed and compacted in a stable location.

10. Remove berms except as designed.

11. Block the road by constructing a triple tank trap so that four wheel highway vehicles cannot pass the point of abandonment. If necessary construct a vehicular turn-around near the point of abandonment.

12. Revegetate all exposed soils resulting from the abandonment work in accordance with "Section 10 - Revegetation".

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the contract administrator, to avoid landing failures and potential debris slides.

9.2-2

Purchaser shall provide for drainage of all landing surfaces as approved, in writing, by the contract administrator.

SECTION 10 – REVEGETATION

10.1-1

Purchaser shall revegetate all exposed soils within the grubbing limits resulting from construction, reconstruction, or abandonment.

10.1-2

Purchaser shall perform revegetation during the first available opportunity after construction, reconstruction, or abandonment is completed. Soils shall not be allowed to sit exposed for longer than one month without receiving revegetation treatment unless otherwise approved in writing by the contract administrator.

10.1-3

Revegetated soils that fail to germinate or are disturbed and re-exposed through any cause shall be revegetated to the point of full coverage.

10.2-1

Revegetation of all exposed soils shall be accomplished by manual dispersal of grass seed and fertilizer unless otherwise detailed in this plan. Other methods of revegetation must be approved in writing by the contract administrator.

10.3-1-1

Seed mix shall meet the following specifications:

Seed Species	% by Weight
Creeping Red Fescue	50
Elf Perennial Rye Grass	25
Highland Colonial Bentgrass	15
White Clover	10

All seed species shall have a minimum 90% germination rate.
Weed seed shall not exceed 0.5% by weight.

10.3-2

Fertilizer shall meet the following specifications:

Chemical Component	% by Weight
Nitrogen	16
Phosphorous	16
Potassium	16
Sulphur	3
Inerts	49

10.3-3

Revegetation application rates shall result in 50 pounds of in place seed mix and 200 pounds of in place fertilizer mix per acre of exposed soil.

10.4-1

Purchaser shall provide a protective cover over the revegetated area if revegetation occurs between July 1 and March 31. The protective cover may consist of, but not be limited to, such items as dispersed straw, jute matting or clear plastic sheets. The protective cover requirement may be waived by the contract administrator in writing if the Purchaser is able to demonstrate a revegetation plan that will result in the establishment of a uniform dense crop of 3 inch tall grass by October 31.

SECTION 11 - SPECIAL NOTES

11.1

Reconstruction Notes

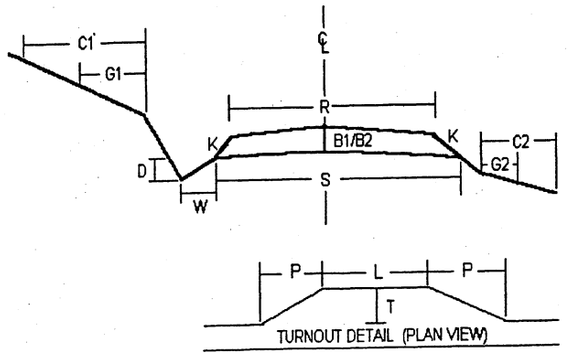
Road	Location	Remarks
FC-ML	217+40 to 244+40	1 Remove waterbars 2 Install culverts 3 Spot patch with 3-inch-minus ballast
FC-ML	244+40 to 258+09	1 Install culverts 2 Blade, shape and ditch the road surface 3 Apply 6-inch lift of 3-inch-minus ballast

ROAD #		FC-ML	FC-ML	FC-ML	FC-ML	FC-51	FC-55	FC-59
REQUIRED / OPTIONAL		Required	Required	Required	Optional	Optional	Optional	Optional
CONSTRUCT / RECONSTRUCT		Reconstruct	Reconstruct	Construct	Construct	Construct	Construct	Construct
TOLERANCE CLASS (A / B / C)		C	C	C	C	C	C	C
STATION / MP TO		217+40	244+40	258+09	301+18	0+00	0+00	0+00
STATION / MP		244+40	258+09	301+18	317+70	1+87	1+50	4+23
ROAD WIDTH	R	12	12	12	12	12	12	12
CROWN (INCHES @ C/L)		3	3	3	3	3	3	3
DITCH WIDTH	W	3	3	3	2	2	2	2
DITCH DEPTH	D	1	1	1	1	1	1	1
TURNOUT LENGTH	L	50	50	50	25	25	25	25
TURNOUT WIDTH	T	10	10	10	10	10	10	10
TURNOUT TAPER	P	25	25	25	25	25	25	25
GRUBBING	G1	--	--	5	5	5	5	5
	G2	--	--	5	5	5	5	5
CLEARING	C1	--	--	10	10	10	10	10
	C2	--	--	10	10	10	10	10
ROCK FILLSLOPE	K:1	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½	1 ½
❖ BALLAST DEPTH	B1	--	6	12	6	12	12	6
CUBIC YARDS / STATION		--	34	72	34	72	72	34
➢ TOTAL CY BALLAST		100*	466	3,103	562	135	108	144
❖ SURFACING DEPTH	B2	--	--	--	--	--	--	--
CUBIC YARDS / STATION		--	--	--	--	--	--	--
➢ TOTAL CY SURFACING		--	--	--	--	--	--	--
➢ TOTAL CUBIC YARDS		100	466	3,103	562	135	108	144
SUBGRADE WIDTH	S	--	13.5	15	13.5	15	15	13.5
BRUSHCUT (Y/N)		N	N	N/A	N/A	N/A	N/A	N/A
BLADE, SHAPE, & DITCH (Y/N)		N	Y	N/A	N/A	N/A	N/A	N/A

❖ Specified Rock Depth is FINISHED COMPACTED DEPTH in inches.

➢ Specified Rock Quantity is LOOSE MEASURE (Truck Cubic Yards) needed to accomplish specified FINISHED COMPACTED DEPTH. Rock quantities include volume for turnouts, curve widening and landings.

TYPICAL SECTION



* Spot patch ballast for waterbar removal and culvert installation.

TS Name: Oso What
App. No. 76067

MATERIALS LIST

LOCATION			LENGTH						RIPRAP					REMARKS
ROAD #	STATION or MILEPOST	DIAMETER	CULVERT	TYPE	DOWNSPOUT	TYPE	FLUME	TYPE	INLET	OUTLET	TYPE	FILL	TOLERANCE	
FC-ML (reconstruct)	221+16	--	--	--	--	--	--	--	--	5	L	--	C	Reconstruct ditchout right and armor.
	226+53	18	40	GM	--	--	--	--	2	3	L	NT	C	
	227+74	18	40	GM	--	--	--	--	2	3	L	NT	C	
	233+23	24	36	GM	--	--	--	--	3	8	H/L	NT	C	
	234+16	18	40	GM	--	--	--	--	2	5	L	NT	C	
	234+84	18	36	GM	--	--	--	--	2	5	L	NT	C	
	236+13	18	40	GM	--	--	--	--	2	5	L	NT	C	
	242+60	18	40	GM	--	--	--	--	2	5	L	NT	C	
	243+60	18	40	GM	--	--	--	--	2	5	L	NT	C	
	249+71	24	40	GM	--	--	--	--	3	10	H/L	NT	C	Replace existing 18" CMP.
	251+50	18	36	GM	--	--	--	--	2	5	L	NT	C	
	255+50	18	40	GM	--	--	--	--	2	5	L	NT	C	
FC-ML (new const.)	260+05	24	34	GM	--	--	--	--	5	10	H/L	NT	C	Replace existing 18" CMP.
	261+48	18	34	GM	--	--	--	--	2	3	L	NT	C	No skew.
	262+99	18	40	GM	--	--	--	--	2	3	L	NT	C	
	265+16	24	40	GM	--	--	--	--	10	20	H/L	NT	C	
	265+39	24	40	GM	--	--	--	--	10	20	H/L	NT	C	
	266+06	18	42	GM	--	--	--	--	5	15	H/L	NT	C	
	267+52	18	36	GM	--	--	--	--	2	8	L	NT	C	No skew.
	270+63	18	32	GM	--	--	--	--	2	3	L	NT	C	No skew.
	272+09	24	36	GM	--	--	--	--	10	20	H/L	NT	C	

Note: Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of the diameter:

Diameter	Gage	Corrugation
18"	16	$2\ ^{2}/_{3}$" x $^{1}/_{2}$"
24" – 48"	14	$2\ ^{2}/_{3}$" x $^{1}/_{2}$"
54" – 96"	14	3" x 1"

GM – Galvanized Metal PS – Polyethylene Pipe Single Wall PD – Polyethylene Pipe Dual Wall AM – Aluminized Metal C – Concrete XX – PD, PS, or GM
H – Heavy Loose Riprap L – Light Loose Riprap SR – Shot Rock NT – Native (Bank Run) QS – Quarry Spalls

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MATERIALS LIST

LOCATION			LENGTH						RIPRAP					REMARKS
ROAD #	STATION or MILEPOST	DIAMETER	CULVERT	TYPE	DOWNSPOUT	TYPE	FLUME	TYPE	INLET	OUTLET	TYPE	FILL	TOLERANCE	
FC-ML (new const.)	273+45	18	40	GM	--	--	--	--	5	15	H/L	NT	C	No skew.
	276+48	18	36	GM	--	--	--	--	2	3	L	NT	C	No skew.
	277+91	24	30	GM	--	--	--	--	5	10	H/L	NT	C	
	278+89	24	30	GM	--	--	--	--	5	10	H/L	NT	C	
	279+77	18	32	GM	--	--	--	--	2	3	L	NT	C	
	281+75	18	32	GM	--	--	--	--	2	3	L	NT	C	
	285+04	18	26	GM	--	--	--	--	2	3	L	NT	C	No skew.
	286+12	18	26	GM	--	--	--	--	2	3	L	NT	C	No skew.
	293+57	18	32	GM	--	--	--	--	5	10	H/L	NT	C	No skew.
	296+16	18	34	GM	--	--	--	--	5	15	H/L	NT	C	No skew.
	298+80	18	30	GM	--	--	--	--	2	3	L	NT	C	No skew.
	302+25	18	36	XX	--	--	--	--	2	3	L	NT	C	No skew.
	304+07	18	36	XX	--	--	--	--	2	5	L	NT	C	No skew.
	310+42	18	36	XX	--	--	--	--	2	5	L	NT	C	
	313+06	18	30	XX	--	--	--	--	2	5	L	NT	C	No skew.
	316+90	18	36	XX	--	--	--	--	2	5	L	NT	C	
FC-59	2+62	18	36	XX	--	--	--	--	2	3	L	NT	C	

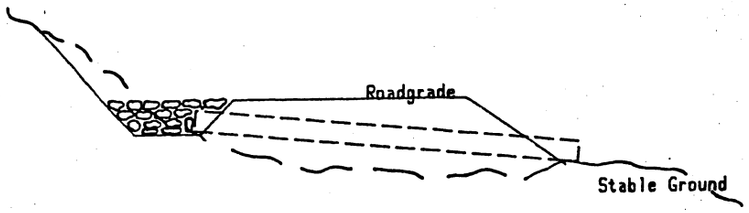
Note: Galvanized metal culverts shall conform to the following specifications for gage and corrugation as a function of the diameter:

Diameter	Gage	Corrugation
18"	16	$2\ ^{2}/_{3}$" x $^{1}/_{2}$"
24" – 48"	14	$2\ ^{2}/_{3}$" x $^{1}/_{2}$"
54" – 96"	14	3" x 1"

GM – Galvanized Metal
PS – Polyethylene Pipe Single Wall
PD – Polyethylene Pipe Dual Wall
AM – Aluminized Metal
C – Concrete
XX – PD, PS, or GM
H – Heavy Loose Riprap
L – Light Loose Riprap
SR – Shot Rock
NT – Native (Bank Run)
QS – Quarry Spalls

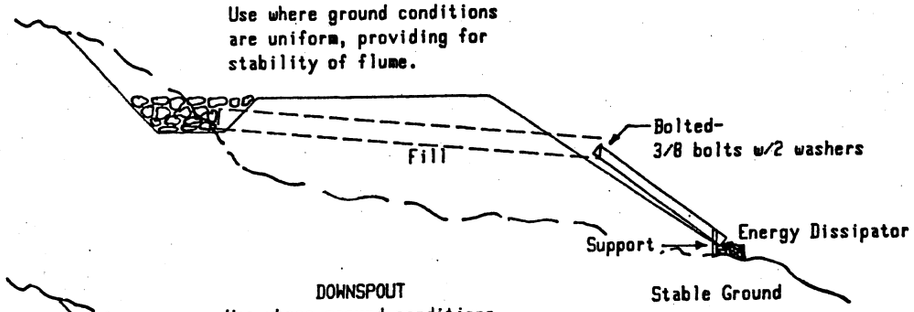
TS Name: Oso What
App. No. 76067

CULVERT AND DRAINAGE SPECIFICATIONS



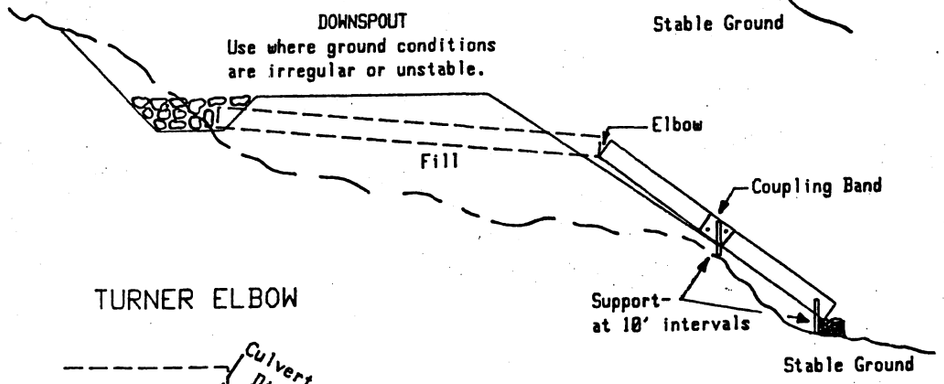
FLUME

Use where ground conditions are uniform, providing for stability of flume.

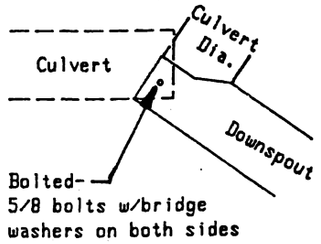


DOWNSPOUT

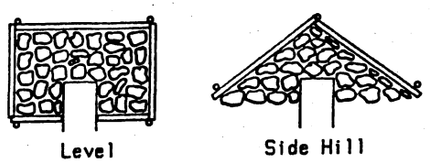
Use where ground conditions are irregular or unstable.



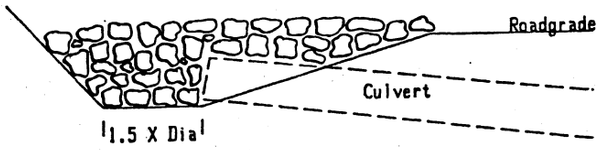
TURNER ELBOW



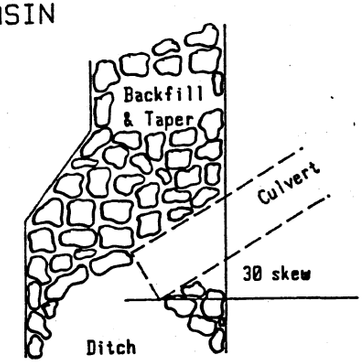
ENERGY DISSIPATORS

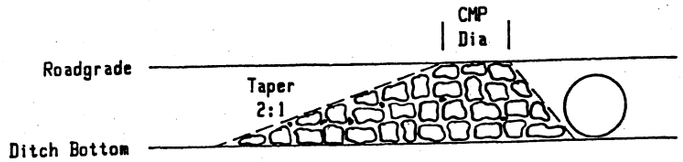


HEADWALL/CATCHBASIN



Headwall to be constructed of impervious material that will resist erosion.





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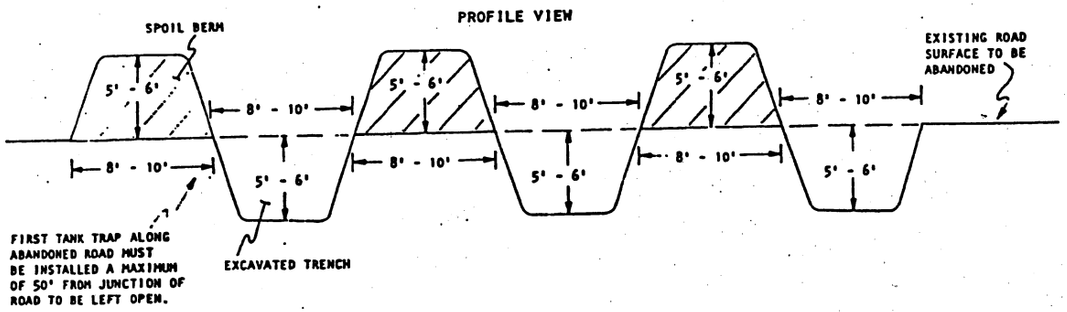
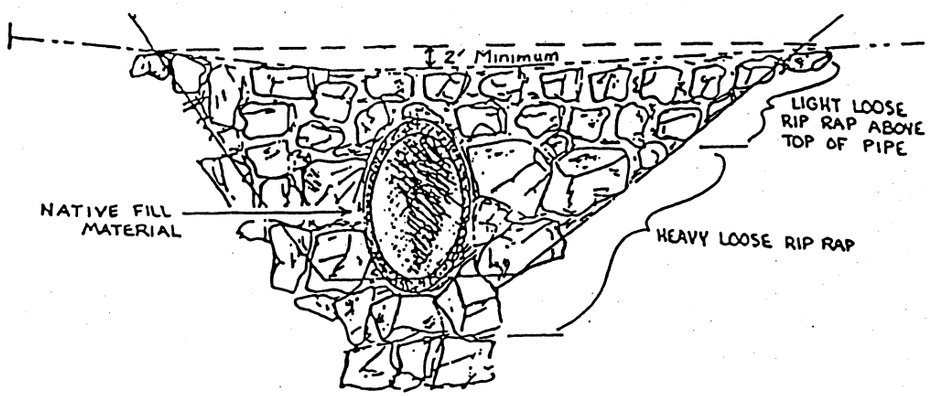
CONSTRUCTION DETAILS

TRIPLE TANK TRAP DETAIL
FOR ABANDONED ROADS

PROFILE VIEW



RIP RAP ARMORED FILL



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PIT PLAN

All rock pit operations in the State of Washington are regulated by the Washington State Department of Labor and Industries. The following clauses (WAC 296-155-66005) are taken from the Department of Labor and Industries publication Safety Standards for Construction Work and are hereby made a part of this contract:

(1) When excavating equipment is used to remove earthen material from borrow pits:

(a) The pit walls shall be maintained in a condition to reduce the possiblility of the walls sliding or caving in where employees could be exposed to the danger of moving ground.

(b) The pit walls shall be maintained at a height no greater than the maximum reach of the excavating machine. (DNR Northwest Region policy specifies a maximum 12 foot high pit wall.)

(c) Employees on foot shall not be permitted to be in close proximity to the pit walls.

(d) Pit walls shall not be undermined.

(e) Wall control.

(i) The safe control of borrow pit walls, including the overall slope of the walls, shall be consistent with:

(A) Recognized engineering standards;

(B) The nature of the ground and the kind of material being excavated.

(ii) Excavation methods shall be selected which will ensure wall and bank stability including benching as necessary to obtain a safe overall slope in accordance with the following table:

Minimum Required Degrees of Slope for Different Types of Soil Encountered in Excavations

Borrow Pit Material	Slope Ratio Horiz:Vert	Slope Angle Vert Degrees
Well Rounded Loose Sand	2:1	27°
Compacted Sharp Sand	1½:1	34°
Average Soils	1:1	45°
Compacted Angular Gravel	½:1	63°
Solid Rock; Compact Shale	--	90°

In addition, the Washington State Department of Natural Resources' Forest Engineering Manual gives further specifications on multi-leveled pit operations:

(1) Limit the width of working benches to a minimum of 1½ times the maximum length of the largest machine in use.

(2) Pit floors and benches shall have a uniform surface and be self drained at a minimum of 2% outslope.

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DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD

ROAD MAINTENANCE SPECIFICATIONS

I. NEW ROADS (Prior to acceptance of contract or acceptance on timber sale)

A. Cuts and Fills

1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1½-1 slopes with selected material or as directed. Remove overhanging material from cut slopes.

2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.

3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface

1. Grade and shape road surface, turnouts and shoulders to original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.

2. Blading must not undercut backslope at bottom of ditchline.

3. Watering may be required to control dust and to retain fine surface rock.

4. Desirable surface material shall not be bladed off the roadway.

5. Replace surface material lost or worn away.

6. Remove berms except as directed by the State.

C. Drainage

1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.

2. Inspect and clean culverts at least monthly, with addition inspection during storms and periods of high runoff. This must be done even during periods of inactivity.

3. Add stable material at outlet end of the culvert as needed to stabilize stream bed.

4. Headwalls - maintain to road shoulder level with material that will resist erosion.

5. Keep silt bearing surface runoff from getting into live streams.

D. Structures

1. Repair bridges, culverts, cattle guards, fences and other road structures to condition required by construction specifications.

E. Termination of Use or End of Season

1. Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch and culvert cleaning, water bars.

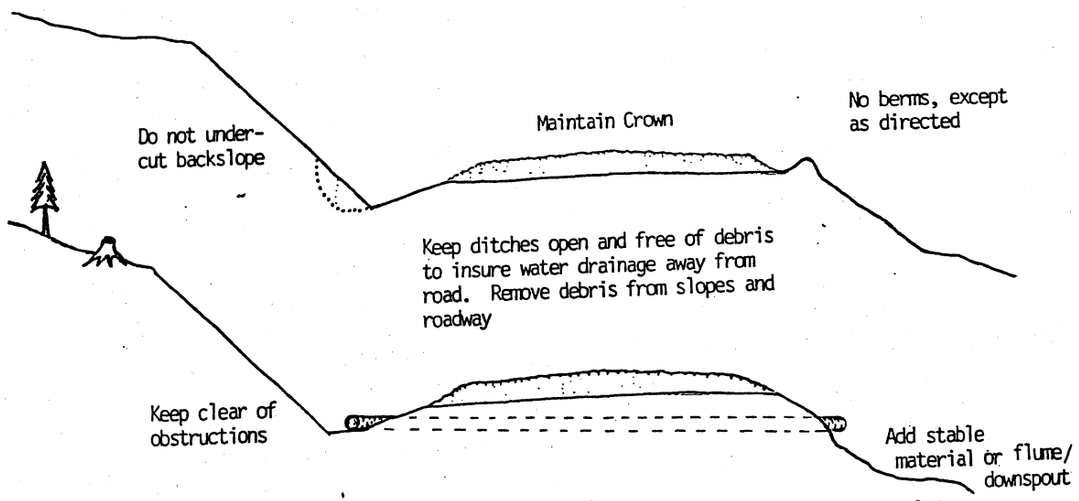
F. Debris

1. Remove fallen timber, limbs, stumps from slopes or roadway.

II. Existing Roads - Timber Sale, Operator Maintained

A. Same as I above but not to exceed the condition of the road on the date the contract was signed.

III. A.R.R.F. - Direct maintenance to comply with these specifications.



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